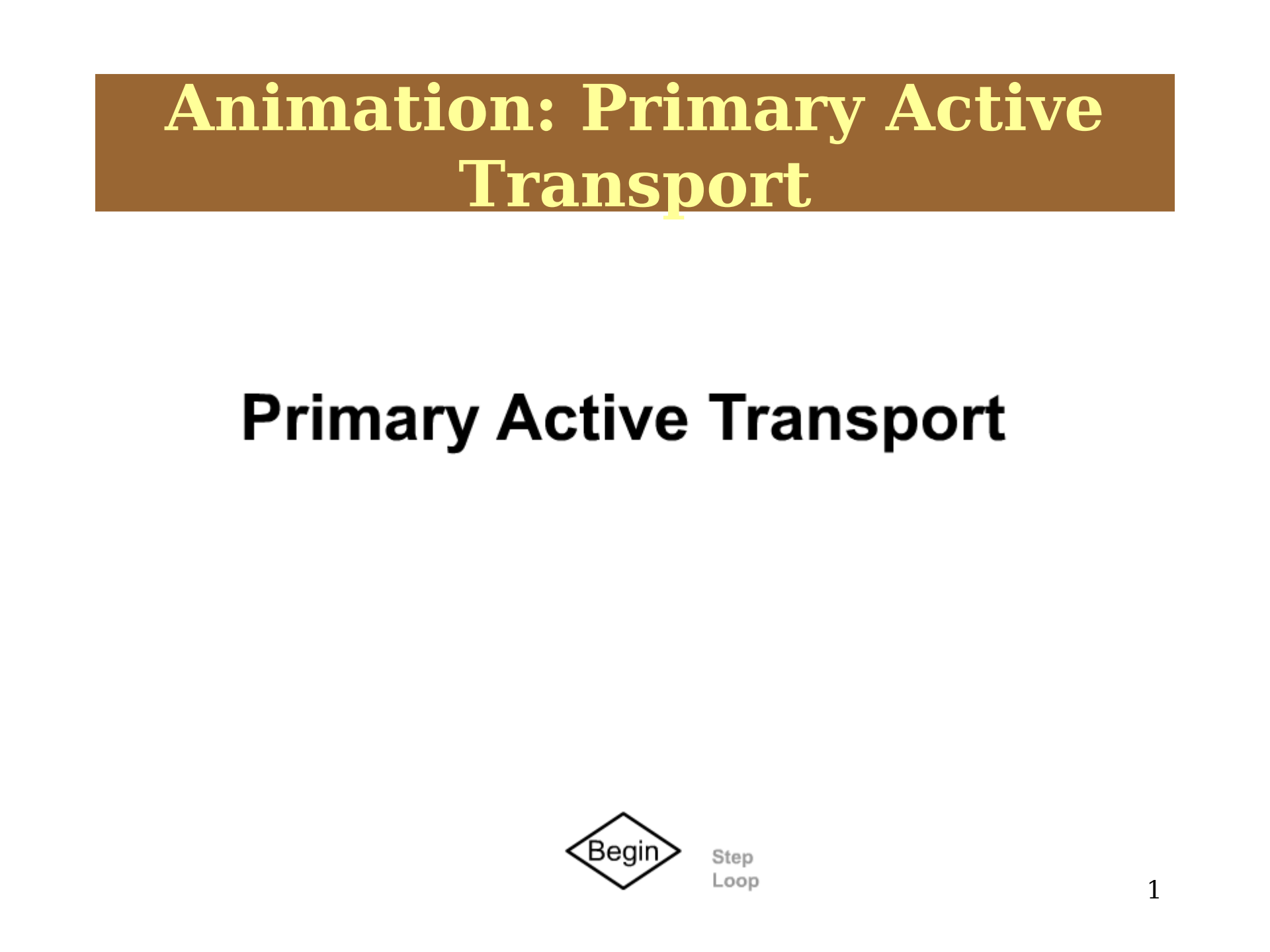
Animation: Primary Active Transport

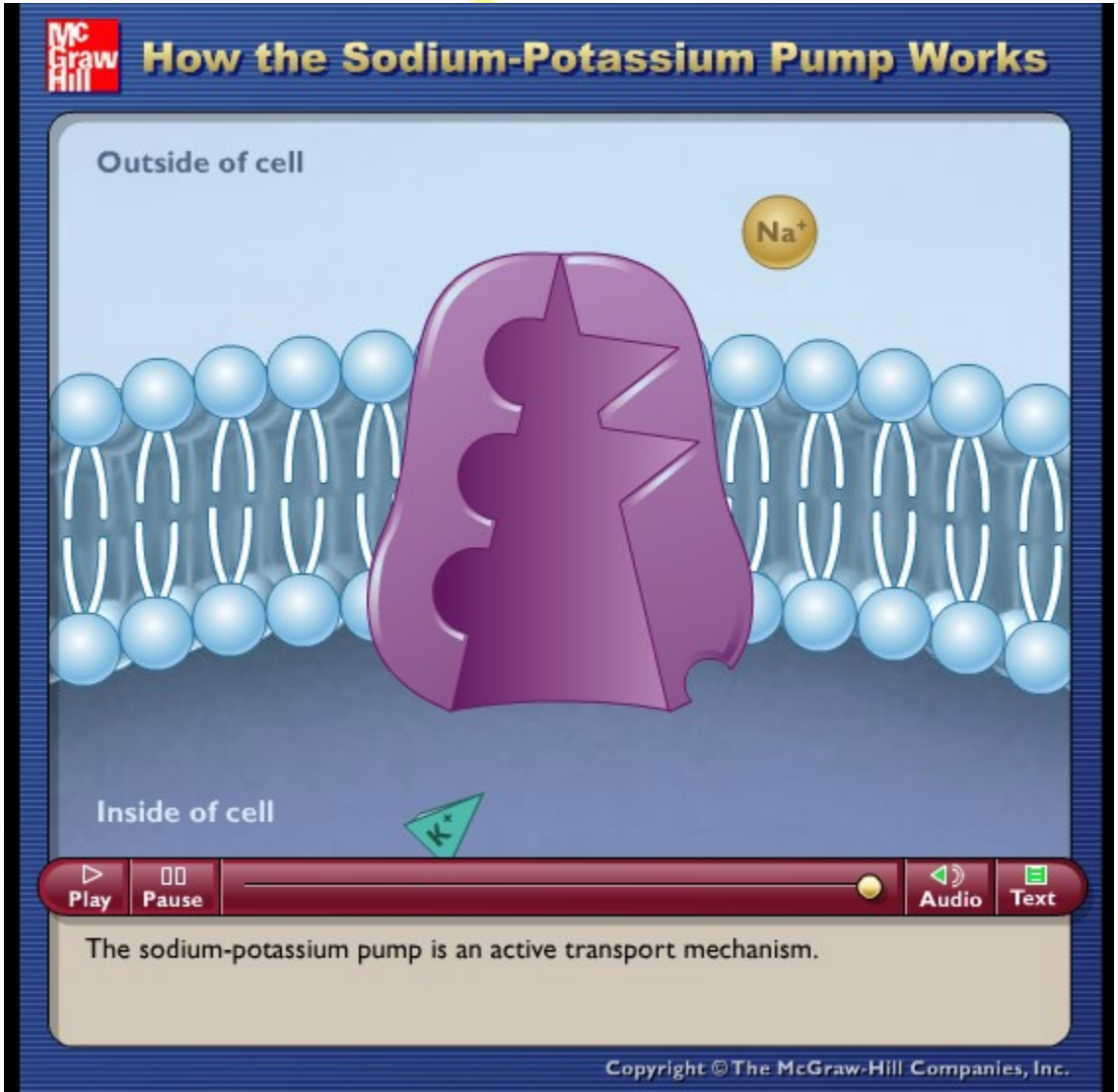


Animation: Secondary Active Transport

Active Transport: Sodium-Potassium Pump

- Active transport mechanism
- Creates balance by “pumping” three (3) sodium (Na+) OUT and two (2) potassium (K+) INTO the cell
- 3:2 ratio

Animation: How the Sodium-Potassium Pump Works



Endocytosis

- Cell engulfs a substance by forming a vesicle around the substance
- Three types:
  - Pinocytosis – substance is mostly water
  - Phagocytosis – substance is a solid
  - Receptor-mediated endocytosis – requires the substance to bind to a membrane-bound receptor

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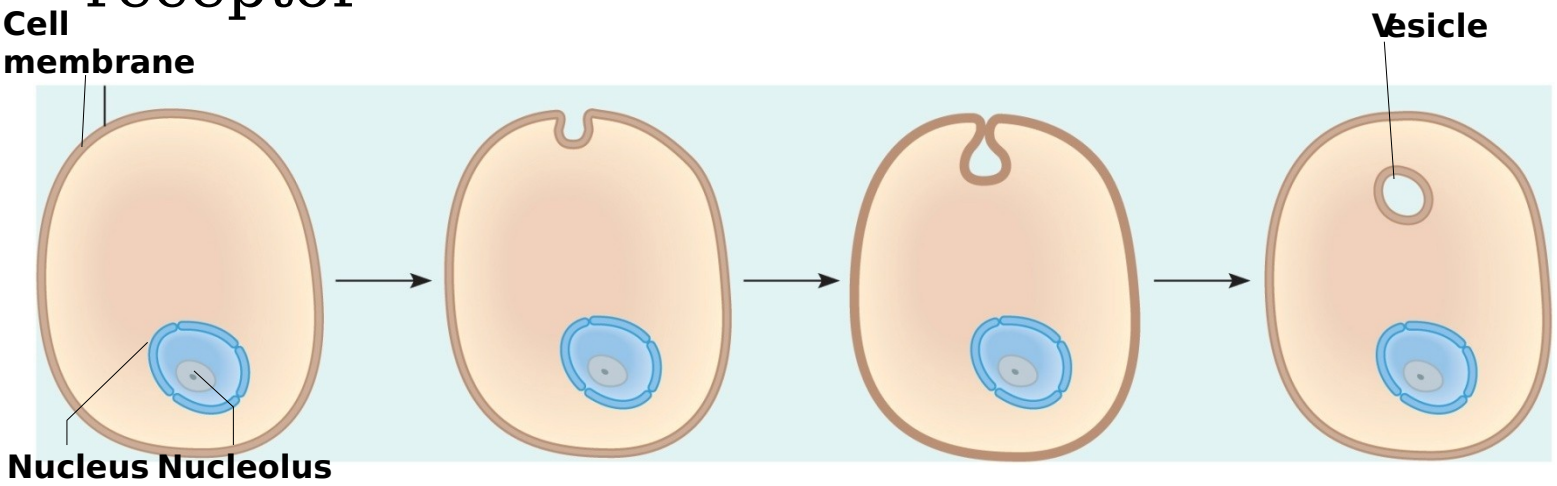

Endocytosis

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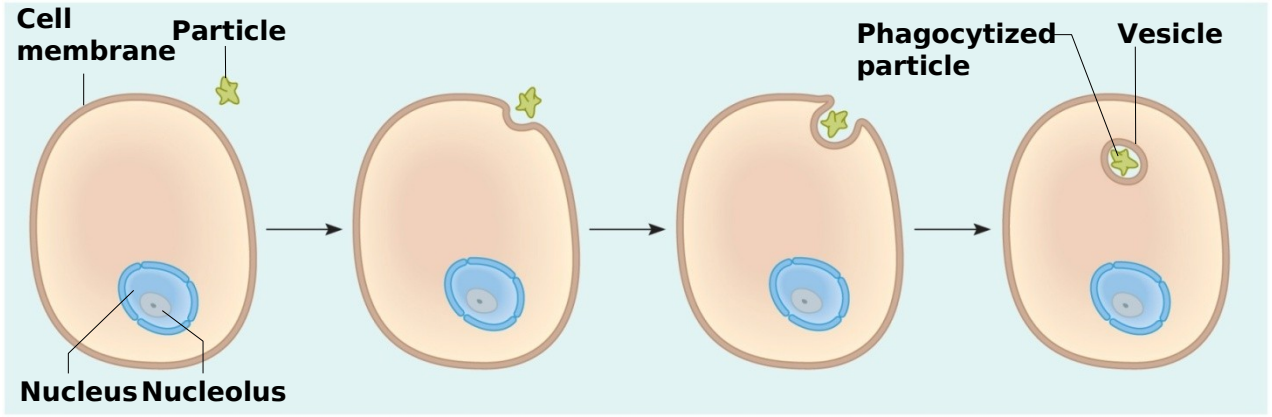

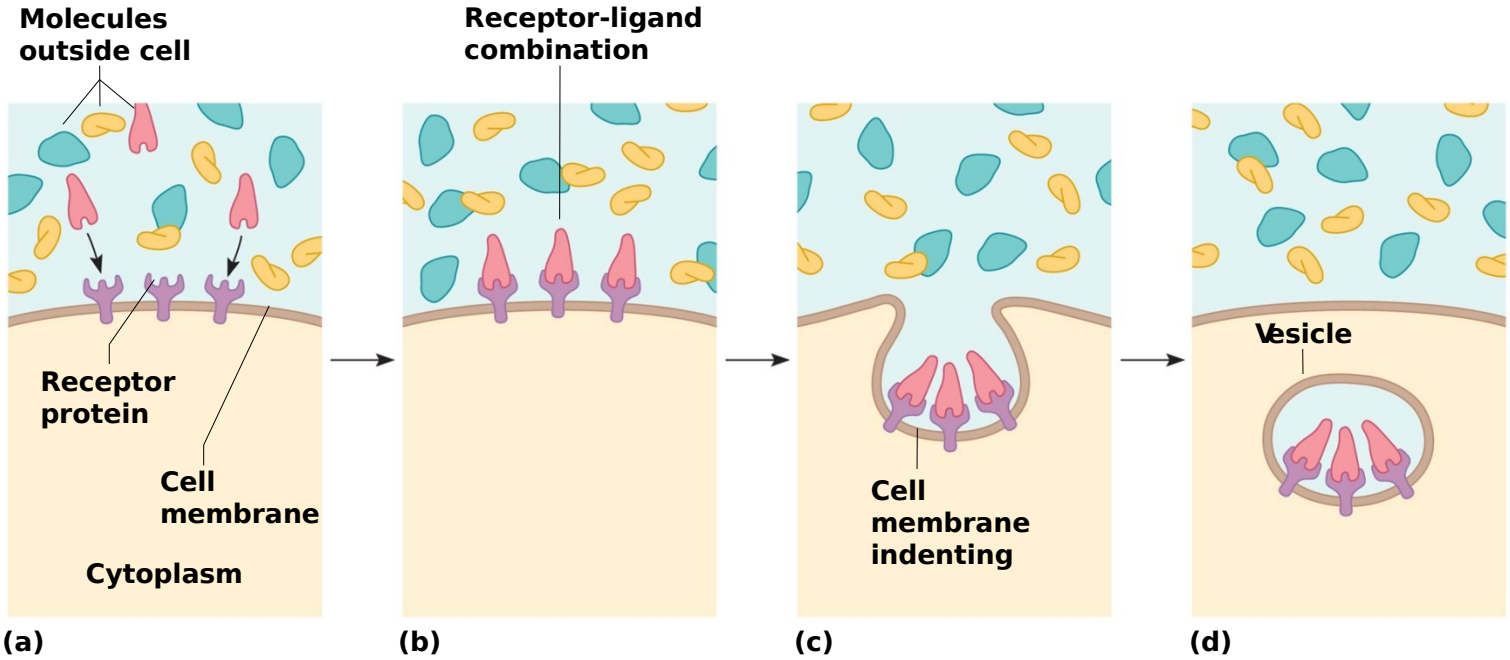

Exocytosis

- Reverse of endocytosis
- Substances in a vesicle fuse with cell membrane
- Contents released outside the cell
- Release of neurotransmitters from nerve cells

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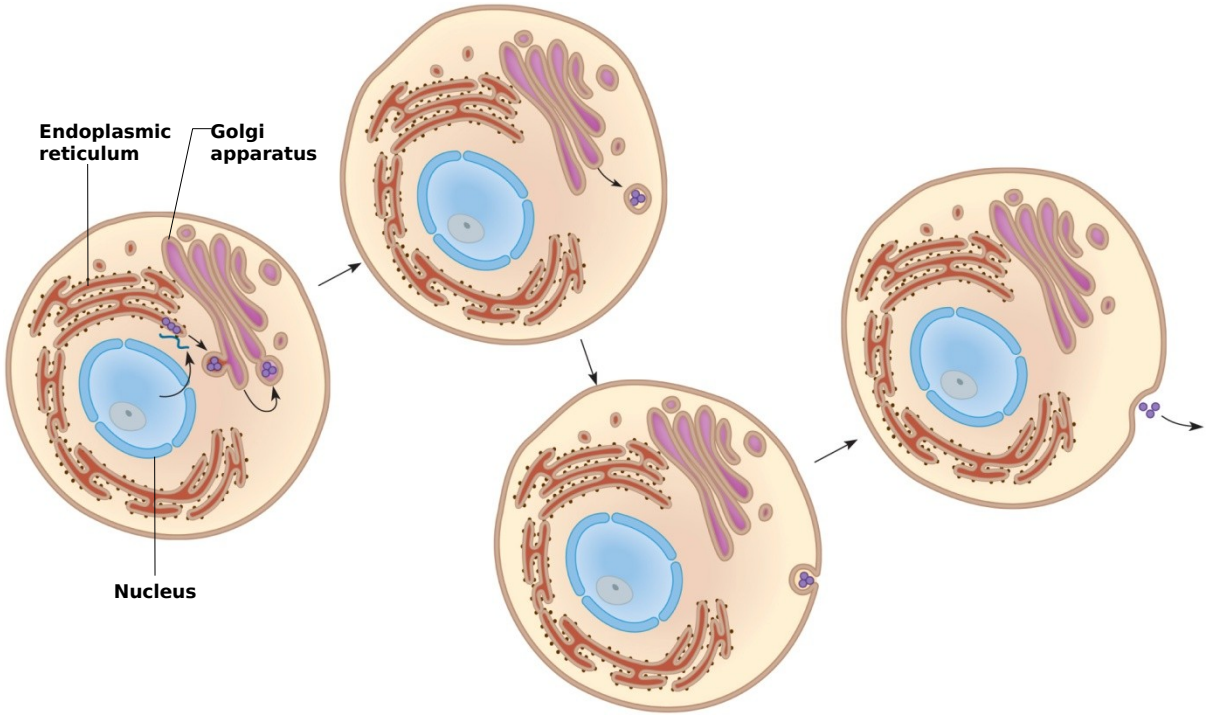
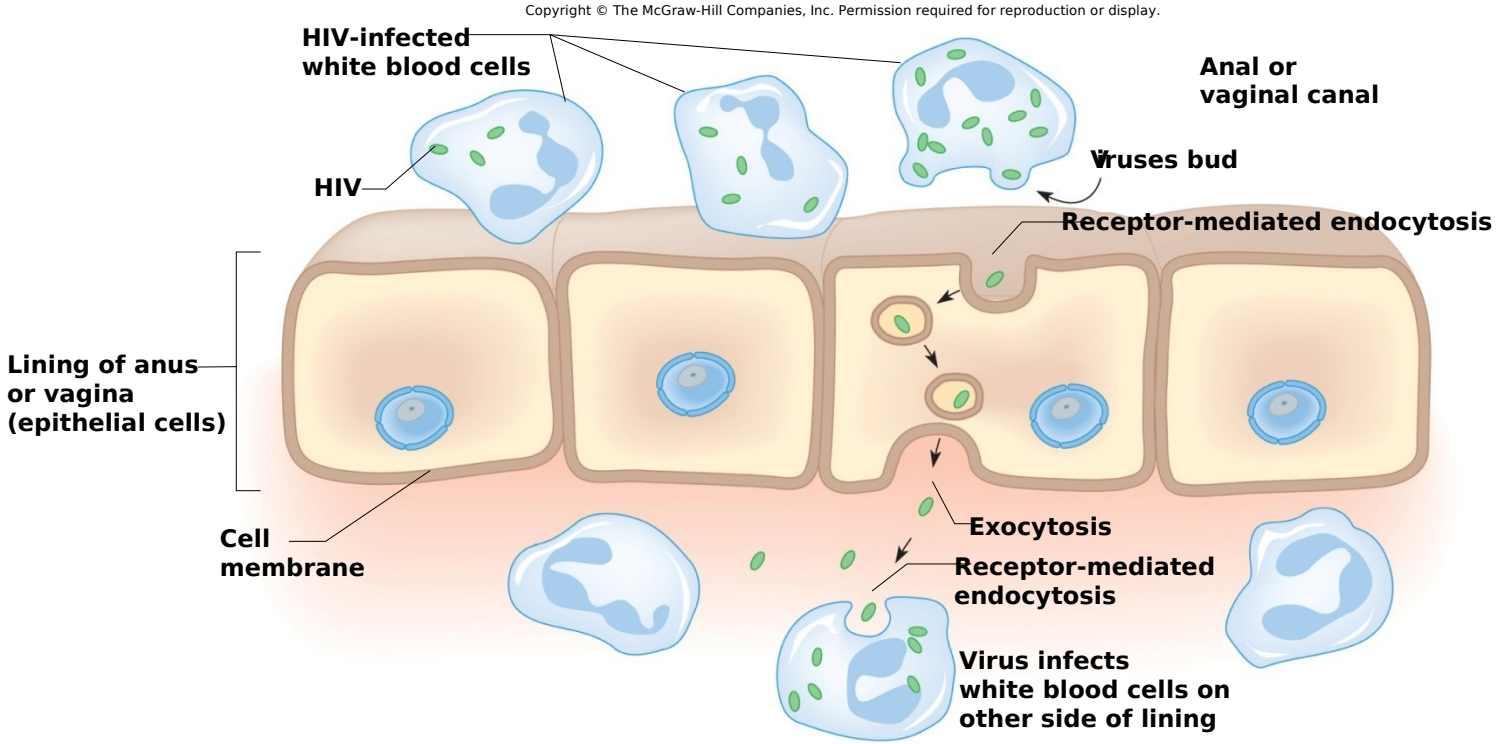


Transcytosis

- Endocytosis followed by exocytosis
- Transports a substance rapidly through a cell
- HIV crossing a cell layer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HIV-infected white blood cells
Anal or vaginal canal
HIV
Viruses bud
Receptor-mediated endocytosis
Lining of anus or vagina (epithelial cells)
Cell membrane
Exocytosis
Receptor-mediated endocytosis
Virus infects white blood cells on other side of lining

3.4: The Cell Cycle

- Series of changes a cell undergoes from the time it forms until the time it divide
- Stages:
  - Interphase
  - Mitosis
  - Cytokinesis

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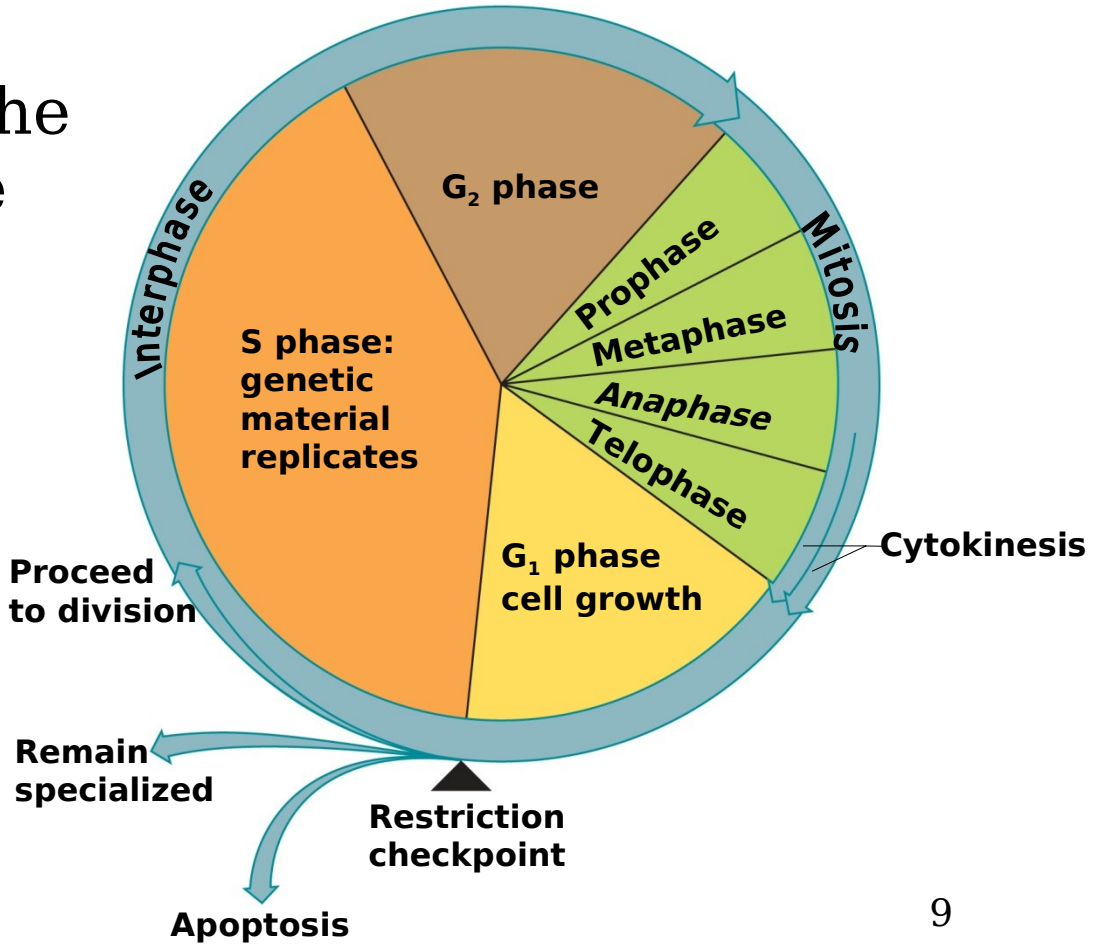

Interphase

- Very active period
- Cell grows
- Cell maintains routine functions
- Cell replicates genetic material to prepare for nuclear division
- Cell synthesizes new organelles to prepare for cytoplasmic division
- Phases:
  - G phases – cell grows and synthesizes structures other than DNA
  - S phase – cell replicates DNA

Mitosis

- Produces two daughter cells from an original somatic cell
- Nucleus divides – karyokinesis
- Cytoplasm divides – cytokinesis
- Phases of nuclear division:
  - Prophase – chromosomes form; nuclear envelope disappears
  - Metaphase – chromosomes align midway between centrioles
  - Anaphase – chromosomes separate and move to centrioles
  - Telophase – chromatin forms; nuclear envelope forms

Mitosis

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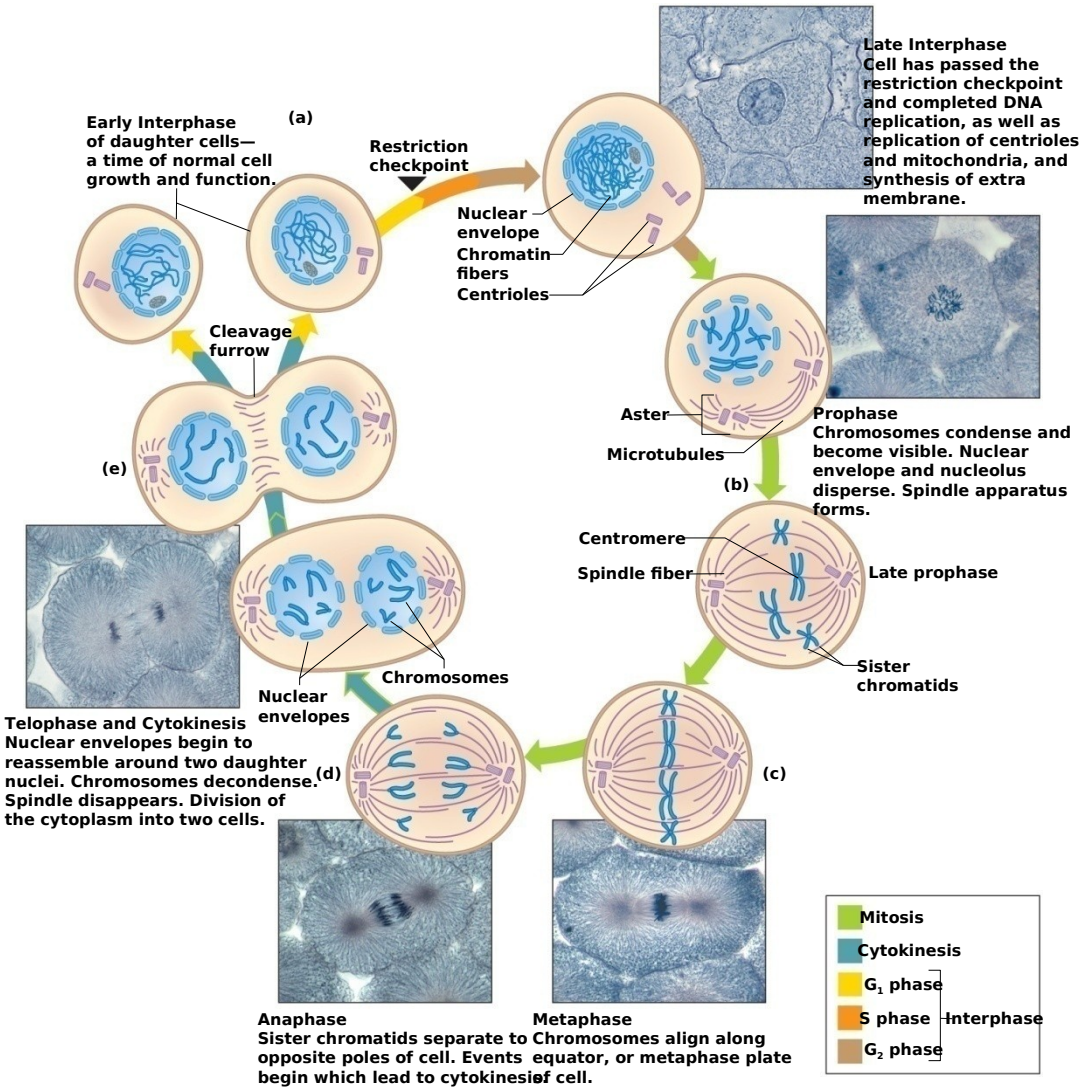

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